

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 1
	APPL NO 530391, 93, 531599	DATE 03-22-12
	PROCESSED BY LLD	CHECKED BY

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COID: 800057

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APPLICATION IN THIS BATCH:

A/N 530393 TV Significant Revision

A/N 530391 Storage Tank No. 30081 (New Construction : P/C-P/O)

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A/N 531599 Rule 462 CMS Plan (amendment to existing plan)

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A/N 530391

TANK 30081

STORAGE TANK NO. 30081, 80'-0" DIA. X 40'-0" H., STEEL PAN TYPE INTERNAL FLOATING ROOF, 30,000 BARREL CAPACITY, WELDED SHELL, WITH CATEGORY A, LIQUID-MOUNTED MECHANICAL SHOE PRIMARY SEAL AND CATEGORY A, RIM-MOUNTED COMPRESSION PLATE SECONDARY SEAL, WITH SLOTTED GUIDEPOLE EQUIPPED WITH GASKETED SLIDING COVER AND FLOAT SLEEVE WIPER.

CONDITIONS:

SEE SAMPLE PERMIT

INTRODUCTION:

This application was submitted 12-28-11 for a new internal floating roof tank. This is part of KM's 19 tank project.

BACKGROUND:

Kinder Morgan Liquids Terminals (KMLT), a subsidiary of Kinder Morgan Energy Partners, operates an existing petroleum product storage tank farm, gasoline bulk loading racks, and a pipeline transfer center at its Carson Terminal, located at the southeast corner of Alameda Street and Sepulveda Boulevard in the City of Carson. This is a major petroleum products terminal which consists of 56 storage tanks, five gasoline loading racks, two vapor recovery and disposal systems, and other ancillary equipment. The total storage capacity is about 4.26 million barrels and the gasoline loading racks handle an average of 1.9 million gallons per day.

The tanks are connected by a pipeline system that allows products to move about the facility as well as with nearby refineries. In addition, large capacity shipping pumps connect the facility to the intrastate and interstate pipeline system from which petroleum products can be transfer to Southern California, Nevada, and Arizona.

The Carson Terminal is a Title V facility with an Initial Title V Application, A/N 338924, filed on 3/24/98, and the facility is currently covered by Facility Permit ID 800057.

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In 2003 Kinder Morgan Energy Partners proposed a major expansion project in the Carson Terminal which consisted of 18 new storage tanks, each 80,000 barrels, and one small new tank of 30,000 barrels. All the new tanks were internal floating roof tanks and were designed to serve multiple products except the 30,000 barrel tank was for transmix storage. The proposed project would increase the storage capacity by up to 25 percent, depending on the projected market demand for petroleum product storage over a period of 10 to 15 years. The project also involved the installation of related piping, manifold connections, pumps and control systems. The new tanks would be located at the south-west corner of the terminal.

Since the proposed project of this size would involve a significant impact on the environment, a full-blown CEQA procedure was initiated by the City of Carson as the lead agency. After a lengthy review process with comments from the public and interested parties, the revised final Environment Impact Report (EIR), Kinder-Morgan Energy Partners, Carson Terminal Expansion, SCH No. 2003061130 was certified on February 8, 2005 (document on file).

PERMIT HISTORY:

As noted in the EIR, the proposed project consisted of 19 storage tanks, but not to be constructed all at once. The time frame to build a certain number of tanks would depend on the market demand and economic conditions within a projected period of 10 to 15 years.

On May 30, 2003 applicant proposed to install eight (8) new, 80,000 barrels internal floating roof tanks and one (1) new, 30,000 barrels internal floating roof tank, as a Phase I project. Accordingly, nine (9) applications for Permit to Construct were filed, A/N 416251 thru 416255, and 416257 thru 416260. The District also received on March 2, 2004 two (2) modification permit applications for No.1 and No. 2 Vapor Collection and Disposal Systems, A/N 426349 and 426350, respectively. The main reason for these two applications was to include or tie-in the vapor recovery service for these nine tanks in case of a drain-dry and refilling or a degassing operation. Otherwise, there would be no change to the control system and the existing permit condition would be the same as before limiting to no more than two tanks to be served at any one time at the facility.

On May 20, 2005, the District issued P/Cs for the Phase I tank project including the two vapor collection and disposal modifications in the Facility Permit ID 800057.

In August 2011, the District cancelled P/C A/N 416260 for Tank 30081 because the permit had expired and KM indicated they no longer plan to install this tank. ERC for 19 pounds ROG was refunded (AQ005299). This was prior to new policy where ERCs were no longer refunded.

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Sometime late 2011, KMLT reevaluated the need for tank 30081 and submitted this application.

PROJECT DESCRIPTION:

Based on info in Phase I project (A/N 416251-60)

Internal Floating Roof Tank

This new tank will receive commodities from existing inbound pipelines at the facility. From these tanks, KMLT will either route the commodities to other existing tanks for temporary storage for respective clients or pass them through the existing outbound pipelines. Although the tank will initially store transmix, the operator will be storing petroleum products that will have true vapor pressure up to 11 psia and have identified the general commodity categories as shown in the table below.

Generic List of Commodities as Provided by Operator

Commodity Description	True Vapor Pressure
R6300 Naphtha, Full Range Reformed	---
Unleaded Regular Gasoline	9-11 psia @ 100 °F
Low Sulfur Diesel 2	low mm Hg
Turbine Fuel – Jet A	---
Diesel Fuel	---
Isooctane	1.7 psia @ 100 °F
Reformate	---
Alkylate	11 psia @ 100 °F
MTBE – phased out by CARB	7.8 psia @ 100°F
JP-4	2-3 psia @ 68 °F
JP-5	0.1 psia @ 68 °F
JP-8	0.04 psia @ 68 °F
Raffinate	0.08-0.12 psia @ 100 °F
Reformulated Unleaded Gasoline	5-11 psia @ 100 °F
Unleaded Gasoline (not reformulated)	5-11 psia @ 100 °F

The annual throughput is 1,800,000 barrels (60 turnovers/year (Form 400E-18 dated 12/15/11)). The tank is equipped with the current BACT primary and secondary tank seal system. The operation of the storage tank is 24 hr/day and 365days/year.

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Fugitive Components

KMLT will also install new fugitive components such as valves, pumps, and other piping details that are associated with these storage tanks.

Emissions Calculations:

Storage Tanks and Fugitive Components

For internal floating roof storage tanks, emissions occur from losses around the rim seal system, the floating deck fittings, and the exposed liquid that clings on the circular wall. The proposed internal floating roof tank, all equipped with approved seal system and deck fittings with gasketed covers, comply with the requirements of Rules 463 and 1178. Thus, the proposed storage tank meet the current BACT standards for emission control. More detailed information, refer to US EPA document, AP-42 Chapter 7, Organic Liquid Storage Tanks dated 9/97.

Under normal operating conditions, VOC emissions are the only criteria pollutants generated from tanks serving petroleum products. For the tank, based on worst case data of gasoline service with 13 RVP and 1,800,000 bbls/yr throughput, the VOC emissions could be estimated by using EPA TANK 4.0.9d. Refer to computer printout in the file each Application file. Also, use Rule 1306(b) and (d) to determine the new source emission, potential to emit, and the required offsets.

Tank No. 30081:

$$\begin{aligned}
 \text{Potential to emit; VOC emissions} &= 2007.45 \text{ lbs/year} \\
 &= 189.3 \text{ lb/mo (Aug)} \\
 \text{BACT 30-day ave.} &= 189.3/30 = 6.31 \text{ lbs/day}
 \end{aligned}$$

In addition, the new tank will have fugitive components consisting of a 15 valve counts and other pipe fittings as shown in the submitted document. Using the Correlation Equation and a **300 ppm** Screening value, the estimated total fugitive VOC emission is:

$$\begin{aligned}
 \text{VOC(fugitive)} &= 339.24 \text{ lb/yr} \\
 & * 1/365 = 0.93 \text{ lb/day/tank} \\
 & * 1/360 = 0.94 \text{ lbs/day/tank (30-day avg)}
 \end{aligned}$$

This is less than the 1 lb/day BACT trigger level (See attached Excel Spreadsheet "Fugitive Emissions Calculations" App B of KMLT submittal dated Dec 2011). In this case, leakless valves (BACT) will not be required.

Thus:

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$$\text{VOC}(R1 = R2) = 6.3 + 0.94 = 7.24 \text{ lbs/day (30-day)}$$

$$*1/24 = 0.30 \text{ lb/hr}$$

$$*360 = 2606.4 \text{ lb/yr}$$

Application Number	Description	Max ROG Emissions Lb/day
530391	New Tank 30081	7.24
TOTAL		7.24 lb/day

ERC needed: $\text{ROG} = 7.24 * 1.2 = 8.688 \text{ lb/day (9 pounds)}$

Toxic Air Contaminants (TACs)

VOC emissions emitting from petroleum product storage tanks normally include certain amounts of TACs depending on the products stored. Based on submitted data, the worst case scenario of gasoline service with maximum toxic weight fractions, the table below shows the TAC mass emissions for each proposed internal floating roof tank. Again, this procedure follows the previously approved Phase I project.

Annual Emissions $\text{ROG} = 2606.4 \text{ lb/yr}$

TAC Emissions from Storage Tank

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr
Benzene	2.80	72.98	0.00833
Ethyl benzene	0.10	2.61	0.00030
n-Hexane	4.13	107.64	0.0123
Toluene	1.46	38.05	0.00434
Xylenes	0.51	13.29	0.00152

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Naphthalene	0.0014	0.036	4.17E-6
Methanol	1.60	41.7	0.00476
Hydrogen fluoride	1.00	26.06	0.00298
Hydrogen sulfide	1.00	26.06	0.00298
Styrene	0.16	4.17	0.00048
Butadiene	0.11	2.87	0.00033
Cresol	0.0013	0.034	3.87E-6
Phenol	0.0015	0.039	4.46E-6

In accordance with the procedures prescribed in the District's Risk Assessment Procedures for Rules 1401 and 212, a Tier 3 Screening Modeling or the SCREEN3 analysis was performed (see Excel Spreadsheet Tier 3 Screening Risk Assessment).

Assume: Volume Source
Urban Option
Residential/school = 366 m = 1200 ft (From SFPP Map)
Commercial = 71 m = 250 ft (from SFPP Map)
Tank Dimensions: H = 40 ft. = 12.19 m.
Diam. = 80 ft = 24.38 m.
Area base = $3.14 * r^2$
= 5024 sq. ft.

Surface area side = $2 * 3.14 * \text{radius} * H$
= 933.2 sq.m.

Lateral Dimension(yo)=Equiv. length of Side/4.3= $933.2/2)^{0.5}/(4.3)=5.02$ m.
Vertical Dimension (zo) = Height/2.15 = $(12.19/2.15) = 5.67$ m.

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The results indicate that the MICR for the residential receptor is 2.04E-07 and for the worker is 5.76E-07. Thus, the MICR is less one in one million and each chronic and acute index is also well below the threshold limit of 1.0.

EVALUATION:

- 212: Public Notice is not required since facility is not within 1000 feet of a school, emission increases are less than threshold and the tank has an MICR less than one in a million. HIA and HIC are less than one.
- 401: Visible emissions are not expected under normal operation from storage tanks.
- 402: Compliance records indicate that there are no N/C and NOV's for the past three years and the facility is expected to continue in compliance with the rule.

Rule 463 – Organic Liquid Storage, Amended Mar. 11, 1994

Internal floating roof tank consists of a steel pan floating roof, mechanical shoe primary seal (Category A) and rim-mounted single wiper, secondary seal system (Category A). Both primary and secondary seals are independently attached, separate from each other. All openings and fittings shall be gasketed. The concentration of organic vapors in the vapor space cannot exceed 30% of LEL. Compliance is expected.

Rule 1149 – Storage Tank Cleaning and Degassing, Amended May 2, 2008

VOC emissions during cleaning and degassing of the storage tanks are to be controlled by one of the control methods mentioned in this rule. Compliance is expected.

Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities

1178(d)(3)(A):The applicant will fit each fixed roof support column and wells with gasketed sliding covers

1178(d)(3)(B):The applicant will fit the ladder well with a gasketed cover

1178(d)(3)(C):The applicant has equipped other roof openings according to the subparagraph (d)(1)(A).

1178(d)(3)(D):The proposed installation of a mechanical shoe primary seal and secondary seal system meets this requirement. Compliance is expected.

1178(d)(3)(E):Require the applicant to ensure that the organic vapor concentration in the vapor space is less than 30% of its LEL. Compliance is expected.

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REGULATION XIII – New Source Review

1303(a): BACT.

BACT for internal floating roof tanks is listed in the table below. BACT for internal floating roof tanks are Category A primary seal and secondary seals. The applicant has proposed to install a mechanical shoe primary seal and a rim-mounted wiper secondary seal system. BACT for fugitives is not triggered since fugitive emissions for the tank is less than one pound per day using the correlation method and a 300 ppm limit.

Current BACT for Storage Tanks

Equipment	VOC	NO _x	SO _x	CO	PM ₁₀
Internal Floating Roof	Category A Tank Seals and Comply with Rule 463 (10-20-2000)				

1303(b) There is an increase of 7.24 lb/day. ERC of 9 pounds ROG will be required.

Rule 1401 – New Source Review of Toxic Air Contaminants

The maximum toxic constituents for the tank yield MICR values less than one in a million. HIA and HIC are each less than one. Compliance is expected.

40 CFR 60 Subpart Kb

This new internal floating roof tanks will be equipped with primary and secondary seals and other components as required by this rule.

40 CFR 63 Subpart R

This tank will comply with the applicable requirements of this rule by complying with Kb.

40 CFR Subpart EEEE

This tank is subject to this rule when storing non-gasoline organic liquids (such as ethanol) and will comply with all applicable requirements.

Reg XXX: Title V: Since this is a new tank subject to Federal requirements Kb and R, this is a “significant revision” to an existing TV facility permit. A 45-day EPA review period and a 30 day public comment period is required.

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CONCLUSION:

This project will meet all District Rules and Regulations. It is recommended that Permit to Construct/Operate be granted subject to the attached conditions after completion of the 45-day and 30-day comment periods.

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A/N 531599
RULE 462 CMS PLAN

INTRO/SUMMARY:

This application was submitted 1/04/12 to amend their existing CMS Plan (currently approved under A/N 452201) to change the “strip chart recorder” to an “electronic data recorder”.

Language referencing “strip chart recorder” will be modified to “electronic data recorder” and the following condition added:

THE RECORDING DEVICE SHALL ARCHIVE DATA IN A SECURE ENCRYPTED FORMAT TO NONVOLATILE DATA STORAGE. DATA SHALL BE RECORDED AT A FREQUENCY OF NOT LESS THAN ONCE PER MINUTE. THE RECORDER/SOFTWARE SHALL BE CAPABLE OF DISPLAYING AND PRINTING OUT PLOTS OF THE COMBUSTION TEMPERATURE WITHIN 3 HOURS OF A REQUEST. WHERE EXTERNAL STORAGE MEDIA IS USED, IT SHALL BE REPLACED AT A SUFFICIENT FREQUENCY TO ENSURE THAT THE AMOUNT OF STORED DATA IS AT NO MORE THAN 90% OF THE STORAGE CAPACITY OF THE MEDIA.

Additionally, condition no. 2 requiring the thermocouple be located at 35 feet will be modified to refer to the thermocouple location described on the Permit to Operate. Currently, the existing Permits to Operate for the VRS's (A/N 469051:G11318, cond. 14 of VRS no. 2 and A/N 523131:G14632, cond. No. 14 of VRS no. 1) already describe the location of the thermocouple at 35 feet. Language in this plan will be modified as follows to remove redundancy.

THE THERMOCOUPLE SHALL BE MAINTAINED IN EACH THERMAL OXIDIZER, AT A LOCATION DESCRIBED IN ITS CURRENT PERMIT TO OPERATE, TO ACCURATELY MEASURE THE TEMPERATURE OF THE COMBUSTION PRODUCTS.

CONCLUSION:

This plan will comply with the requirements of Rule 462. A Conditional Plan approval is recommended after a 45-day EPA review period.